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EVALUATION OF THE 1980 ROUND OF POPULATION AND HOUSING CENSUSES IN AFRICA

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1. Introduction

1. It may be recalled that the African Census Programme (ACP), financed by UNFPA, was instituted in 1971 to assist some African countries to carry out their censuses in the 1970 round of census programmes. However the ACP was continued till 1977, and thus a number of countries which received assistance under the ACP, conducted their censuses during the 1980 round. The countries are: Burkina Faso (1975), Central African Republic (1975), Ivory Coast (1975), Madagascar (1975), Somalia (1975), Cameroon (1976), Mali (1976), Senegal (1976), Mauritania (1976/77), Niger (1977), Benin (1979), and Burundi (1979). In addition to these countries, 35 other African countries have undertaken censuses during the period 1975 to 1984. Thus the number of African countries which took part in the 1980 World Population and Housing Census Programme was 47. The remaining three countries are Chad, Nigeria and Sierra Leone. Of those three countries, Chad has never had a population census. UNFPA, however, fielded a population Basic Needs Assessment Mission in February 1985 and it is expected that plans for the first census would be initiated when circumstances permit. Nigeria, on the other hand conducted censuses in 1963 and 1973 but the results of the last census in 1973 were cancelled and there has not been any population census since then. A draft project request for the next census was prepared in November 1983 but up to the time of writing this paper no decision had been taken regarding plans for its implementation. Sierra Leone should have conducted its census in the 1980 round of censuses in 1984 but due to the late start of the census preparatory activities, the census enumeration date was postponed and it is expected to be conducted in December 1985.

2. It is also worth mentioning that for 19 of the 47 countries which took part in the 1980 round of censuses, it was their first modern population census. The countries in this category are: Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Djibouti, Equatorial Guinea, Ethiopia, Guinea, Guinea Bissau, Ivory Coast, Madagascar, Mali, Mauritania, Niger, Rwanda, Senegal, Somalia and Zaire.

3. Although it is recommended that a census be taken at least once in every ten years the interval between the last two censuses in many African countries was more than 10 years. This is also true of some of the censuses taken in earlier periods. The problems which have made it difficult to adhere strictly to decennial census programmes include: delays in geographic preparations, political disturbances, parliamentary/ presidential elections, general economic difficulties, etc..

4. An operation of the magnitude of a census can hardly be carried out without some problems. An evaluation of the 1980 round of African censuses is therefore useful since it would reveal the lessons from the past and thus assist in the improvement of data collection programmes.

2. United Nations Recommendations

5. Following the practice for the 1960 and 1970 World Census Programmes, the United Nations Statistical Commission adopted a set of recommendations for the 1980 census programme. The recommendations were developed over a number of years through consultations between United Nations Headquarters, the regional commissions and individual countries. Before the recommendations were finalized, they were discussed by the Expert Group on Global Recommendations for the 1980 Population and Housing Censuses which met at United Nations Headquarters from 16-24 January 1978.

6. The global recommendations are divided into three parts: operational aspects of population and housing censuses; topics and tabulations for population censuses; and topics and tabulations for housing censuses. In adopting the recommendations, the United Nations Economic and Social Council recommended, "inter alia, that Member States undertake to carry out population and housing censuses during the period 1975-84 and that they take into account international recommendations relating to population and housing censuses."

7. In addition to the global recommendations, there were regional recommendations. For the African region, the Working Group which met at ECA Headquarters, Addis Ababa from 10 to 14 July 1978, provided guidelines on programming and organization of censuses, budget, census cartography, publicity, concepts, definitions and classifications including topics to be investigated and tabulations to be prepared, enumeration procedures, census documents, census tests, use of sampling, recruitment and training of census personnel, data processing, coverage and content error evaluation, census data analysis, publication and dissemination of census results.

3. Census Project Requests

8. A number of the countries which conducted their censuses during the period under consideration initiated the census preparatory activities with a request for assistance by ECA or United Nations Headquarters in the preparation of a project request. Such project documents were usually submitted to UNFPA for financial support.

9. In a few instances, census project documents were prepared by the countries themselves but frequently such documents had to be revised with the assistance of United Nations regional or inter-regional advisers to conform with UNFPA policies and guidelines regarding project requests.

10. Project requests generally took six or more months to process and in some cases a further six or more months elapsed before the delivery of the external inputs particularly the fielding of international personnel. This clearly shows that project documents need to be prepared in good time to ensure that census programmes would be implemented on schedule.

A review of the censuses undertaken with UNFPA assistance during the 1980 round of censuses indicates that in many cases not only were project documents prepared late in relation to the expected date for initiation of census activities but also there was the tendency for countries to initiate preparatory activities only when the level of external assistance was known. In fact in some cases, the necessary preparations to ensure immediate effective use of the external inputs were not made, hence further delays in the implementation of project activities occurred even after the delivery of the inputs.

11. A related issue was the tendency for some census organizers in the African region to look on census project documents solely as instruments for requesting funds from external sources. Thus the use of the project document also as an implementing guide was often overlooked. The institutional framework, work plan and advance preparations and obligations indicated in project documents were therefore often ignored with the result that bottlenecks were experienced at various stages of a number of census programmes.

12. It has also been observed that in a number of instances adequate financial, material and manpower resources needed for the various phases of censuses were not made. For instance, provision for publication or other channel of disseminating the information was left for consideration at a later date. This was true also of plans and programmes of data evaluation and analysis. It may be recalled that at a seminar organized by ECA in 1973 it was stated that "there is a common tendency in some of the developing countries that after the first spurt of activities in connection with census taking there is a marked lag when it comes to processing of data. Computerisation has not eased the situation. Publication generally is so delayed that sometimes it is not completed even when the next census has arrived or passed. Attention then shifts to the new data rather than getting out what was produced earlier with so much efforts of men and materials." It seems that there has been only marginal improvement in the situation, if at all, since that statement was made.

4. Organization and administration of census programmes

13. A population census has been described as the single most extensive and complex statistical operation. Such an undertaking therefore requires careful planning. A number of activities have to be carried out at the planning stage. The initial principal preparatory activities cover the following: legal basis, institutional framework, census calendar and budget.

a) Legal basis

14. The legal basis for censuses carried out in the region was either the general statistics legislation or a specific census law. In some cases, in addition to the statistics or census law, special presidential order, proclamation or gazette notice was required. Often the order or notice had to indicate the census enumeration date as well as the topics to be investigated. Thus census preparatory activities needed to be initiated before the order or gazette notice could be published. However, in some countries without permanent census organization, it was the census order or proclamation which would indicate government commitment to the census and thus strengthen the hands of the census organizers in mobilizing the required resources both in terms of manpower and materials. In at least one country the census law even indicates the organizational structure for the census.

15. The restrictive provisions of census legislation as well as the delay in publishing the required census order or proclamation did have some adverse effect on implementation of census programmes. It is therefore suggested that census organizers need to review existing census legislation and appropriate steps taken timely to make the legislation flexible with respect to the census organizational structure and the topics to be investigated.

b) Institutional framework

16. In the area of institutional framework for censuses conducted in the region during the period under consideration, there has not been any significant change since the 1970 round of censuses. Some countries continued to set up ad hoc organizations for their censuses while others mobilized the staff of the statistics offices or strengthened the demographic statistics divisions within the statistics offices with the secondment of staff from other government agencies for the census activities.

17. High turnover of staff however continued to deplete the stock of expertise for census operations in some statistics offices. Some countries responded to the situation through reliance on international personnel provided under technical assistance programmes. In a number of cases the international personnel had to work without effective national counterparts. Thus the transfer of expertise to local personnel which should be part of such technical assistance was not realized. It is suggested that a more lasting solution to the problem regarding staff turnover should include a continuing training programme for staff at both professional and middle levels and improvement in working conditions of staff of statistics offices.

18. A review of organizational structure of census offices during the 1980 round of censuses in the region reveals also that in a number of countries without permanent census offices, effective division of labour was not maintained in the ad hoc census offices which were set up. This was the case even in some cases where it had been indicated in census project documents that the offices would comprise units responsible for specific activities such as cartography, statistical planning, field organization, publicity, data processing and administrative support including logistics. In some cases, even though some attempts were made to set up the various units, the staff assigned for census duties expecially in the area of administrative support services were not released early enough on full-time basis. In other cases, the head of the statistical office retained responsibility for the co-ordination of census activities, and thus the day-to-day administration of the census office in addition to his normal duties. Such situations resulted in certain cases in bottlenecks in the implementation of census programmes and delays in completion of some census preparatory activities.

19. there was also the tendency in some countries for the census to be considered as the exclusive responsibility of the statistics office and thus other government agencies were reluctant to release staff on secondment for census duties or provide some facilities such as loan of vehicles. In a few cases, the statistics office itself was not keen in obtaining staff on secondment from other agencies even though it did not have staff with all the expertise required for the various census operations.

20. It is suggested that with the relatively short history of censuses in the region, at least during the post-independence period, and the limited experience in censuses as well as limited facilities, censuses should be considered as national exercises requiring the collaboration of other government agencies. Such collaboration should not affect the leading role of the statistics or census office in the census programme since the final responsibility for the planning and execution of the census should rest with that office.

c) Census calendar and budget

21. Another activity which needs to be carried out at the early stages of census planning is the preparation of the census calendar or time-table. Such initial calendars were generally prepared for the censuses carried out during the 1980 round of African censuses. In the case of censuses conducted with external financial assistance the initial calendars were included in the project requests.

22. The initial census time-table, however, needs to be updated and made more detailed as the census programme progresses and more information becomes available. In general, only partial effort, if at all, was made to prepare detailed time-tables which would have served as a guide for measuring progress and controlling the numerous census operations. Thus, in a number of instances, census enumeration dates had to be postponed several times, while in others, crash programmes had to be instituted with the result that almost all activities of the statistical office were interrupted.

23. It must be emphasized that, since a census need to be considered not as an isolated exercise but rather as part of a continuing programme of data collection which includes other statistical enquiries, the non-adherence to a census time-table tends to disrupt other statistical programmes. If due consideration is not given to the full implications of a late revision in the census time-table on other statistical activities then bottlenecks would occur and the entire statistical services would become unduly burdened.

24. The preparation of the census budget also needs early attention in census planning. It is closely related to the census calendar since there need to be a financial estimate of the cost of each census operation. Information on census costs from a previous census provides an important basis for the preparation of the census budget. However, such information was not readily available in most of the African countries which conducted censuses during the period under consideration.

25. Problems relating to the timely release of funds after the census budget had been approved also had adverse effects on the implementation of census programmes. Some of the problems were due to inflexible financial regulations and the tendency for ministries responsible for finance to treat the census as routine administrative activity. Census organizers in a number of countries, however, found a way out of such situations by obtaining permission to open special census accounts with the national bank and the census budgetary allocations paid into it.

26. Other budgetary problems were due to the economic difficulties in many African countries during the period of the 1980 round of censuses. Unlike the situation during the 1970 round of censuses, it was difficult to obtain external assistance for payment of local costs during the 1980 round. The poor economic situation, however, made it difficult for many African countries to bear all local costs, in particular the payment of salaries and allowances of the large number of temporary field staff required for cartographic field work and census enumeration. Such financial problems delayed the delivery of government inputs, often at critical stages of census programmes.

27. It needs, however, to be emphasized that the indications seem to be that external assistance for censuses would continue to be on diminishing levels, hence African countries should depend more on their own resources for the implementation of census programmes. It is therefore essential that census programmes should be accorded appropriate recognition in government development programmes.

5. Census publicity and education programmes

28. Publicity now seems to have been recognized as essential for the success of a census, thus publicity campaigns were included in the preparatory activities of censuses conducted in the African region during the 1980 round. The intensity and timing of publicity programmes, however, varied among countries. Some publicity campaigns were started only a couple of months to the census enumeration while others could cover only parts of a country mainly urban areas.

29. The available mass media such as radio, television, mobile cinema vans, posters and the press were used in census publicity campaigns. Some countries used, in addition to the above mass media, traditional authorities, local headmen and public meetings to good effect in the rural areas. Committees were also set up at national and sub-national levels in some countries to plan the strategies for the census publicity.

30. The educational aspect of census publicity programme which should explain census concepts, reasons for various questions on the census questionnaire and also provide guidance on how questions should be answered, however, did not receive adequate attention. A typical example was in connection, with the concept of 'census night' or 'census day'. In a number of countries, the publicity campaign failed to educate the public on the distinction between the 'period of enumeration' and the "census reference night or day". Thus the public expected enumeration to be completed in one day and many people remained at home expecting enumerators to call on them. This caused some confusion and special announcements had to be made hurriedly to save the situation.

31. It was also indicated in a number of census project documents that school lesson notes would be prepared and used in schools so that school children could be used to spread the census message. This strategy did not seem to have been implemented in a satisfactory manner. In some countries, the lesson notes were not prepared and in others, the notes were ready for use just when the schools were breaking for vacation so their effect was very minimal, if at all. In at least one country, though the notes were prepared in good time, the distribution was not adequately supervised so a good number of them only ended at local education offices.

32. An aspect of census publicity programme which also did not receive adequate attention in some countries is its co-ordination with other census pre-enumeration activities. Attention was usually focused on the census enumeration without much regard given to other preparatory field activities such as cartographic field work and census tests. Some pre-enumeration field activities therefore ran into difficulties since publicity had not preceded them.

33. It must, however, be mentioned that since in many cases the census was the second or third in the post-independence period there was general co-operation from the public. In a number of countries, the problem which census organizers faced was rather how to obtain effective co-operation and collaboration of other government agencies. The need for specialized campaigns aimed at central authorities and regional and district officials in a census publicity programme therefore cannot be overemphasized.

6. Census cartography

34. On the whole, much effort was put into census cartographic preparations in many countries during the 1980 round of censuses. In some countries, advantage was taken of the cartographic field work to prepare a gazetteer of localities. In other countries the potential of census cartographic work was not fully exploited. In such countries, post-enumeration cartographic work including preparation of publication maps and presentation of census data with maps were ignored.

35. Despite the efforts made to prepare maps to assist in controlling census enumeration, a number of problems and weaknesses in census cartographic programmes were evident. Some of the problems were in connection with the following: preparation of cartographic work plan, training programmes for cartographic staff, production of Enumeration Area (EA) and Supervision Area (SA) maps, availability of suitable base maps, adequate map storage and inter-censal mapping capability.

36. One of the major weaknesses in census cartography during the 1980 round of censuses in many African countries was the relatively poor preparation of work plan for cartographic activities. It is essential that in the preparation of a cartographic work plan, due consideration is given to the need for personnel with proper skills in mapping, the equipment and supplies required for the various phases of the cartographic work and the costing of the entire programme. The work plan should also include the early determination of administrative and statistical areas for which census data will be reported and the coding schere which will ensure unique identification of each area. An examination of census

cartographic programmes of many countries which conducted censuses during the 1980 round, however, shows that plans of cartographic activities were not adequately prepared. Often the objectives of the cartographic work were ill-defined, or even when they were clearly stated, the plans which would ensure the realization of the objectives were hardly implemented as envisaged.

37. Some of the problems may also be attributed to cartographic training programmes which in many cases proved ineffective. In general, office cartographic staff received on-the-job training under an international resident expert/ECA regional adviser or at the local survey department's office or training school. Also, senior staff expected to be involved in census cartographic work were sometimes sent abroad for training. Inadequacies in some overseas training programmes, however, resulted in the application of suspect procedures and relatively poor management of census cartographic operations. The problem may be attributable to the type of emphasis given in the training programmes. Indeed, indications were that equitable balance between geography and demographic aspects on the one hand and surveying cartography on the other seems to have been seldom achieved in some of the training programmes. For example, courses in pure cartography at survey department training schools do not usually cover issues of census taking, and conversely, courses in census geography tend to concentrate on geographic aspects (such as coding) without adequate attention to map production. Census cartography, however, needs to be considered as a hybrid subject; thus it is necessary that the cartographic staff should receive instructions in both cartography and census geography in order to gain all-round comprehension.

38. In the case of cartographic field staff, inadequate preparations for their training and rushed training programmes did contribute to incorrect plotting of localities, poor delineation of EA boundaries, failure to complete cartographic field work and confusion over some definitions such as household, dwelling unit, compound, etc. The need to spend more time on field exercises during training and to make greater efforts in preparing instruction manuals and field forms cannot be over-emphasized. It was observed that in the cases where mainly verbal instructions were given to cartographic field staff much confusion resulted later on.

39. Another weakness in census cartographic programmes of some African countries during the period under review is related to the supply of maps to census enumeration field staff. In a number of countries, though great efforts were made to delineate EAs and produce the necessary maps, copies of EA maps were not given to enumerators. Distribution of the census maps was limited to supervisers and district census officers though it was recognized that EA maps help to ensure good coverage.

A variety of reasons were given for the practice. These include: insufficient time, shortage of printing paper and other printing materials, electricity breakdown, etc. In one country where an attempt was made to get around some of the problems, enumerators were given duplicate copies of original tracings made at the time of the field mapping instead of printed paper copies of the maps. The strategy proved adequate under the prevailing circumstances but, generally, it cannot be recommended since errors could be introduced during the hand-copying process.

40. Non-availability of suitable and up-to-date base maps also continued to be one of the major problems in census mapping in the African region during the period. The availability of country-wide coverage of maps of less than ten years old and at scales suitable for rural and urban use (e.g. 1:50,000 and 1:5,000) would have made it possible for even cartographic units with the most limited resources to produce reasonably adequate maps for census enumeration. In the circumstances, the ever increasing costs of air-photography, ground control and field completion as well as difficulties in maintaining equipment, obtaining chemicals and printing plates and retaining qualified and experienced staff in government service all contributed to the slow output of new base maps.

41. Other related problems are the failure of statistical/census offices to provide adequate facilities for map storage and to establish inter-censal mapping programme. Very often maps are not safely preserved from one census to another. If better storage had been arranged, maps from the 1970 round of censuses could have been more extensively used in the 1980 round; but too often, they had been lost or damaged in the inter-censal period. Further, many countries in the region failed to establish formal ongoing mapping programmes after the 1970 round and thus there was generally very low level of inter-censal cartographic capability in statistical/census offices, if any. In many cases, therefore, cartographic work for the censuses in the 1980 round had to begin from scratch and this undoubtedly contributed to the failure to complete census cartographic preparations satisfactorily in many countries.

42. Geographic preparation is an important element in any data collection especially population censuses. In a large number of countries, this important aspect was not given its due importance in the programme of activities and the effect has been that the quality of data and its use was reduced. For example, in some instances, the validity of results from post-enumeration surveys was vitiated and could not be used because of poor delineation of enumeration areas.

7. Tabulation and publication programmes

43. The determination of census objectives and the preparation of a programme of basic analysis of the census data should be carried out at the early stages of census planning. The objectives need to be expressed in the form

of a tabulation programme and their formats and it is advisable that consultations are held with major data users before they are finalized. It is also essential that both the preparation of the programme of basic census analysis and the tabulation programme should precede the design of the census questionnaire. Alternatively, all three documents may be considered jointly.

44. Some countries which conducted censuses during the period followed the sequence indicated above while others delayed the preparation of the tabulation programme till after census enumeration when manual processing was already in progress. In the latter cases, it was at times realized that certain tabulations which were required could not be produced either because the topics involved were not investigated in the census or the coding system did not permit the preparation of the required tabulations.

45. In almost all the censuses carried out during the period, the census organizers made some effort to ascertain the needs of data users before the final version of the tabulation programme was prepared. The efforts made by census organizers to hold consultations with data users, however, received mixed response. While some data users gave serious consideration to the draft tabulation programme and the proposed census topics, others only gave half-hearted reaction and their participation in any follow-up conference was at a low level. There is therefore considerable room for improvement in the dialogue between census organizers and data users at the early stages of census planning before the tabulation programme is finalized.

46. It is encouraging to note that in many cases there was collaboration between the subject-matter specialists and the electronic data processing personnel in the preparation of the census tabulation programme, at least its final version. Unfortunately, despite such collaboration, there were still delays in the completion of the design and testing of data processing plans which also delayed the preparation of census tabulation in a number of countries. The delay in finalizing the tabulation programme and in preparing editing specifications were some of the reasons. Other reasons were the late installation of processing equipment and lack of experienced data processing personnel.

47. There was also the tendency for some census organizers to prepare a long list of tabulations without any indication of the order of priority and at times without reference to the immediate basic analysis expected to be carried out by the census office.

48. In addition to the tabulation programme, most countries prepared a publication programme. The publications proposed were generally similar to those published during the 1970 round of censuses. They include: a number of volumes of statistical tables on demographic, social and economic characteristics as well as household characteristics; and analytical and administrative reports. Some countries included the analytical and administrative reports in one volume while others published the administrative report as a separate volume. It has been recommended that there should also be a publication on the highlights of the census results for the general reader and decision-maker.

49. It may be recalled that in 1973 at the ECA Seminar on techniques for evaluation of basic demographic data, it was stressed that the census publication programme should include analytical reports and monographs. Only a few countries have attempted to carry out the suggestion. Further, some of the census reports have been very technical and thus of limited value for the planner and decision-maker. Perhaps census data application may be maximized if census organizers prepare two types of reports which will serve the needs of statisticians and demographers on the one hand and planners, administrators and decision-makers on the other. In addition, census organizers should prepare an administrative report which should give detailed account of the census activities including the problems faced, how they were tackled and lessons learnt as well as the details of census costs.

8. Topics investigated

50. Generally, the United Nations global and African regional recommendations as well as topics investigated during the 1970 round of censuses provided the basis for the selection of topics for investigation in African censuses during the 1980 round.

51. The first draft list of topics was in many cases sent to major data users for their comments. In some countries the list of topics was also discussed by a technical advisory committee set up to advise census organizers on technical issues relating to the census. The comments of data users and advisory committees were taken into consideration in the preparation of a revised list of topics for field testing.

52. The following table shows the topics which were covered during the 1980 round of censuses in Africa and the number of countries which investigated those topics:

Census topics	No. of countries	Census topics	No. of countries
Geographic and migration characteristics		Economic Characteristics	
Place at time of census	36	Activity status/Economic activity	38
Usual residence	35	Occupation	42
Place of birth	43	Industry	36
Previous residence	14	Status in employment	37
Residence at past specified date	18	Sector of employment/ Type of establishment	8
Duration of residence/year of immigration	23	Secondary occupation	6
Place of origin	3		
Place of work	4		
Residence status (Present/Absent)	29		

Census topics	No. of countries	Census topics	No. of countries
Demographic and social characteristics		Housing conditions	
Sex	47	No. of houses/buildings	6
Age	47	Type of housing unit/ living quarters	17
Relationship	47	Quality of housing/ condition of dwelling	3
Citizenship/Nationality	42	Construction material of wall	24
Ethnicity/Tribe	31	Construction material of roof	25
Literacy	25	Construction material of floor	13
Language	13	Age of building	8
School attendance	37	Number of rooms	20
Educational attainment	44	Tenure/type of occupancy	22
Educational qualification	15	Water supply	26
Religion	13	Toilet facilities	21
Marital status	42	Bathing facilities	6
Form of marriage	1	Cooking facilities/ Kitchen	10
Age at marriage/duration of marriage	9	Source of fuel	8
Number of spouses	4	Source/Types of lighting	21
Children ever born alive	29		
Children living/dead	29	Community level variables	4
Births past year/date of last birth	30		
Survival status of last birth/past year births	21		
Survival of parents	9		
Survival of spouse			
Deaths in household past year	17		
Physical status/disability	8		
Transportation	6		

53. The topics which were investigated by all the 47 countries which conducted a census during the 1980 round are: sex, age and relationship. Some of the countries, however, included 'relationship' on the census questionnaire just for identification purposes and the information was not processed further to produce tabulations relating to household composition and structure.

54. A comparison of the topics covered in African censuses with those recommended by the African Working Group shows that the recommended topics were investigated in the censuses of at least 50 per cent of the African countries which took part in the 1980 round. However, the most popular topics other than sex, age and relationship which were investigated by at least 75 per cent of the countries are:

Place at time of census
Place of usual residence
Place of birth
Citizenship/nationality
School attendance
Educational attainment
Marital Status
Activity status/economic activity
Occupation
Industry, and
Status in employment

55. The least favoured of the recommended topics are: place of work and survival of parents which were investigated by only four and nine countries respectively.

56. The questions on housing conditions which were investigated by 20 or more countries are: construction materials of wall and roof, number of rooms, tenure/type of occupancy, source of water supply, toilet facilities and source/type of lighting. Some countries had population and housing questions on the same questionnaire though in some cases such questionnaire was used only in urban areas. In a few countries, for example the Gambia and Mauritius, the housing census preceded the population census in a two-phased census enumeration programme.

9. Enumeration procedures

57. Both the 'de jure' and 'de facto' approaches were used in the African censuses conducted during the period. Some countries asked questions which made it possible to determine both the 'de facto' and the 'de jure' populations while others enumerated either the 'de facto' population only or the 'de jure' only. In the cases where both types of populations were investigated, the household population was classified into three categories, namely, usual household members present (at reference night/day), usual household members absent and visitors. The detailed census questions were then obtained in respect of the 'usual members present' and 'visitors' if the population was being enumerated on a 'de facto' basis. If the population was being counted on a 'de jure' basis, the detailed questions were addressed to usual members present and usual members absent. In a few cases, the detailed questions were asked of all three categories and the distinction between the 'de facto' and 'de jure' population was made at the data processing stage.

58. The method of enumeration also was not the same in all the censuses conducted during the period though the general pattern involved the use of trained enumerators in a house-to-house canvassing.

59 In at least one country --Mauritius-- questionnaires were distributed to households a few days before census night, and heads of households were required to complete all questionnaire items except those on economic characteristics. Collection of the questionnaires started on the day following census night. Before collecting the completed questionnaires, enumerators checked the entries on the spot and completed the questionnaire columns on economic characteristics. In one other country --Mozambique-- a combination of the group assembly method and house-to-house canvassing was used in the enumeration of the population. The group assembly method was used in areas of dispersed settlements while house-to-house canvassing was confined to areas of high density.

60. Duration of census enumeration generally ranged from 5 to 14 days and in most cases actual enumeration started on the day following the reference night except the institutional population which was enumerated either a couple of days before the reference night or on the eve of the reference night and then updated the day following the reference night. There were however a few deviations from this general pattern.

61. In at least one country --Swaziland-- preliminary enumeration of the entire population was carried out during the ten days preceding census night and a final enumeration lasting four days carried out after census night to check whether respondents spent census night in the homesteads concerened and any necessary amendments were then made.

62. The procedure of advance enumeration is used as a strategy which would allow sufficient time for enumeration and yet would ensure simultaneous enumeration since extended enumeration period after census reference night/day would then be avoided. The procedure, however, is often not practicable and may rather lead to confusion which may adversely affect the quality of the census data.

63. It is therefore desirable that advance enumeration be restricted to institutional population; and it should be carried out just a day or two before census night and the information updated immediately after census reference night. Since institutions generally keep records of inmates, advance enumeration may be less difficult to manage than in the case of private households. Further, institutional population constitute a small proportion of the total population; and also it needs to be borne in mind that it would be more difficult for enumerators to relate the census items to the reference point when enumeration is carried out several days before the census reference point in time.

10. Quality control of enumeration

64. The control of the quality of the work done at the enumeration phase of a census programme cannot be over-emphasized. This is because the quality of field work with respect to coverage and the collection of the required information concerning respondences determines the basic accuracy of the census data.

65. The major elements involved in the control of the quality of enumeration include the selection and training of field staff, supervision, and control of performance of both supervisors and enumerators.

66. A review of the enumeration procedures of a number of the African censuses conducted during the 1980 round indicates that generally the quality control of the enumeration phase did not seem to have received adequate attention though the ratio of supervisor to enumerators of about 1:5 was a marked improvement over the situation during the 1970 round in some countries when the ratio was around 1:10.

67. Many countries organized training sessions ranging from a few days to two weeks for the supervisors and enumerators. In some countries the training consisted of lectures, class and home exercises, demonstration interviews and field exercises. In other countries where the training lasted only a few days the training consisted mainly of lectures and demonstration interviews. In at least one country, which may be classified in the latter group, the census organizers gave copies of the Enumerator's Handbook and the census questionnaire to selected geography teachers of secondary schools and then gave them a day's training. Senior students of secondary schools were then taught by the teachers as part of their geography lessons. Finally census enumerators were selected from the students. Field exercises did not form part of the training of the teachers, hence that strategy for the training of enumerators did not prove satisfactory.

68. Further, with a few exceptions, the enumeration procedures of the African censuses conducted during the period did not include any formal system of quality control of enumerators' work while enumeration was in progress. Supervisors were mostly given general instructions that they should check the work of enumerators to ensure good coverage and accuracy of completed questionnaires.

69. It is suggested that, in addition to ensuring adequate training of the field staff, it will be desirable to introduce a more formal system of quality control of enumeration in African census programmes. This should involve the preparation appropriate reporting forms or workbooks for completion by supervisors during the enumeration period. For the control of coverage, supervisors may be required to list independently a sample of houses or housing units in each enumeration area and later to check whether enumerators have covered those houses or housing units. In addition, supervisors may record the names of persons in each of the houses they have listed and compare with the questionnaires for those houses completed by enumerators. There is also the need for census organizers to prepare for the supervisory staff in the field a formal system for checking the questionnaires completed by enumerators, and definite standards for acceptance or rejection established. Such procedures would provide rational means for controlling the field operation to enable the necessary remedial measures to be taken while enumeration is still in progress. The principles of industrial quality control could also be adapted to the field of the control of enumeration.

11. Census coverage evaluation

70. It is now accepted that a national population census cannot be error-free. It has therefore been recommended that a census programme should include the evaluation of the completeness and accuracy of the census results.

71. The Working Group on Recommendations for the 1980 Population and Housing Censuses in Africa urged that "a post-enumeration survey (PES) for coverage evaluation should be planned, organized and executed as an integral part of a population census and that content errors be evaluated by other methods such as demographic analysis".

72. Despite the above recommendation, only 11 out of the 47 countries which conducted censuses during that period are known to have carried out coverage evaluation surveys as part of their census programmes. These are: Algeria, Botswana, Burkina Faso, Cameroon, Ghana, Guinea-Bissau, Ivory Coast, Kenya, Liberia, Senegal and Zambia.

73. The lack of enthusiasm to the use of a PES to evaluate census coverage and perhaps the non-recognition of the importance of a PES for arriving at the degree of confidence one may have in the census results in the African region may be due partly to the unsatisfactory experience of the few African countries which conducted such surveys during the 1970 round of census and partly to the extra expense involved.

74. It has been reported that the reasons for the failure of the PES programmes during the 1970 round include the following:

(a) unrecognizable boundaries of the sample areas and general weakness in the geographic preparation;

(b) a person often being known by different names; and the same name being used by a large number of persons in an area; and

(c) general fatigue and apathy of enumerators, supervisors and others including the respondents.

75. Improvement in census cartographic preparations may go a long way to eliminate or at least reduce the seriousness of the problem regarding boundaries of sample areas. The difficulty regarding names of persons is part of matching problems and its effect could be minimized with careful planning and testing.

76. It must also be pointed out that most of the coverage evaluation surveys carried out during the 1970 round of censuses followed the classic PES procedure in which emphasis was placed on a high quality survey which was expected to be more complete than the census so that it could form the basis for the measurement of the error in the census. However, as demonstrated by the African experience, the results of that procedure did not produce appreciable results to justify the extra effort and high cost involved in carrying out those surveys.

77. There has therefore been a re-examination of the early PES procedure and this has led to a variant of the method based on dual system of estimation. Thus emphasis is placed on the independence between the census and the survey rather than on attempts to achieve complete coverage in the PES. This procedure was used to estimate the coverage error in the 1974 population census of Liberia; and it was reported that the result was satisfactory and was again used in their evaluation of the 1984 census. Other countries which have used the procedure are Botswana (1981) and Ghana (1984). It is too early yet to indicate that the dual record approach would yield more reliable results. It may be recalled that Ghana (1970) and Ivory Coast (1975) used that approach but did not obtain satisfactory results.

12. Data processing

78. Generally, the data processing phase of African population censuses during the period under consideration involved both manual and machine processing operations.

79. The manual processing comprised limited editing, coding and verification of coding. The manual editing was either done as a separate operation or during the coding. In some countries, coding was done mainly by enumerators during enumeration through the use of questionnaires with pre-coded items. In such cases the manual processing performed in the office was very limited. The effect of such practice on the quality of census data needs to be studied. It is, however, suggested that it may be more desirable for enumerators to record both the verbal responses and the codes rather than the codes alone to enable adequate verification after enumeration.

80. In the countries where coding was done wholly in the office, the general practice was for the codes to be written on the questionnaire. In at least one country, however, even though the initial coding was done on the questionnaires, it was decided to transcribe the codes on to coding sheets before the keying operation. It was feared that, since the alignment of the rows on the questionnaire was not done well by the printer, there might be considerable errors if the codes were keyed directly from the questionnaires. The transcription unduly prolonged the manual processing of the census data.

81. One major problem in the manual processing phase of the census programmes was inadequate record keeping of the performance of coders and verifiers. Thus there was the general tendency to verify coding on 100 per cent basis and there was very minimal feedback, if any, from verification teams to coding teams since record of types of coding errors being made were not kept.

82. The need for record keeping to monitor the production rates and control quality of work of the various processing personnel cannot be over-emphasized. Such records also provide valuable information for planning future operations.

83. Machine processing continued to be one of the serious bottlenecks in census programmes. There was, however, some improvement in the timely collaboration between data processing personnel and subject-matter specialists in the design of census questionnaires and the preparation of tabulation programmes in some countries. In other countries such contacts were made at a rather late stage of census planning, resulting in problems in analysis of data.

84. The need for the design and testing of machine processing plans including computer programmes during the census preparatory activities phase was generally recognized and the necessary provision made in census time-tables. It was often expected that the pilot test would also be used to finalize the machine processing plans but in many cases the expectations were not realized due to a combination of personnel and hardware limitations. In some instances the problem was mainly due to the lack of experienced data processing staff and the late arrival of the international resident advisers. In other instances there were considerable delays in the site preparations and installation of the data processing equipment.

85. The result was that in a number of countries there was an interruption of flow of work from manual processing operations to keying and preparation of tabulations. This in turn caused delays in the publication of census results.

86. A persistent observation has been the inordinate delay in the processing of data. The lack of computer facilities attached to the statistical offices whereby they have to depend upon other agencies whose needs are to be met first before the census data processing is taken up has resulted in delays in the production of tables thus delaying the other processes like evaluation, analysis, interpretation, dissemination and utilization of the data. This is an urgent matter requiring attention by all concerned and unless remedied, may entail undue delays and consequent loss of value of the information collected. Mini and micro computers or other aids may relieve the situation and every effort must be made to rectify the situation with the urgency it deserves.

87. In some countries the delays in data processing were due in part to the fact that data validation was done manually. It is therefore suggested that the computer together with efficient statistical software packages which are now available should be used in data editing in order to complete the processing of census data timely and also ensure more accurate data.

88. It must be stressed, however, that in order to derive maximum benefit from the use of the computer for data validation, there is the need for effective co-operation between subject matter specialists and data processing staff in the development of the edit specifications and procedure.

89. Other data processing problems during the period under review were related to environmental conditions, mainly the fluctuations in the voltage of electricity supply and frequent power cuts. Such problems may be alleviated through the installation of power generators as stand-by and Uninterruptible Power Supply (UPS) systems.

13. Use of sampling in censuses

90. It is generally recognized that sampling plays an important role in a census programme. The various phases of census operations in which sampling has been used to good advantage include census tests, enumeration, quality control, data processing and evaluation programmes.

91. In the African censuses conducted during the period under consideration sampling has been used particularly in testing census questionnaires and enumeration procedures. While some countries used random sample design for such tests others used purposive sampling. It must be pointed out that if the objective of a census test is not to derive any quantitative measures then there is no need for probability sampling. Indeed it is often desirable to use purposive sampling in some census tests since the procedure involves the selection of enough cases of various kinds based on the available information or local knowledge.

92. In a number of censuses conducted during the period though probability sampling was designed at some expense for the pilot censuses the questionnaires were not fully processed to make any statistical inferences. Only general impressions were obtained through visual inspection of the completed questionnaires.

93. The growing need to cover as many topics as possible in censuses also made a number of countries to use sampling to investigate some census topics. This was done generally through the built-in sample procedure in which a long questionnaire was used to cover a sample of the population while a short questionnaire was used on hundred per cent basis. The countries which used this procedure include: Liberia, Sudan, Tanzania and Zambia. Generally the design involved a single-stage cluster sampling with census E.As as sampling units. In at least one country, Lesotho, however the long questionnaire was administered to every tenth household.

94. Some of the countries which used EAs as sampling units in a single-stage area sampling approach attempted to decrease the average size of their census EAs which for the 1970 round was about 1000 persons to about 500 persons during their cartographic preparations. It was the intention to make EAs more efficient for sampling purposes. Time and cost constraints, however, combined to frustrate such efforts. It would be desirable if those attempts were resumed in any subsequent post-enumeration cartographic work.

95. It needs also be mentioned that some countries did have field problems in the simultaneous administration of the long and short questionnaires. In a number of cases the wrong type of questionnaires were used in a sample or non-sample area. The need for strict control of the distribution of documents can therefore not be over-emphasized.

96. Another census operation in which some countries such as Ethiopia used sampling during the period under consideration was data processing. The objective was mainly to produce advance tabulations in order to make some census results available at an early date.

97. Generally the procedure involved the processing of the questionnaires of a sample of EAs for advance tabulation. The experience, however, has been that the recourse to the preparation of advance tabulations has not reduced significantly the time lag between census enumeration and the release of the basic census tabulations. Further, in some instances, the strategy has rather delayed the completion of the planned series of tabulations with a resulting increase in the total census cost.

98. It is therefore suggested that census organizers should rather ensure timely planning of data processing procedures including the selection and testing of appropriate software as part of census pre-enumeration activities in order to speed up the processing of census data. Indeed, with the available high speed data processing equipment and timely planning, it may not be necessary to resort to advance tabulations to ensure early release of census results.

99. Sampling has also been used by some African countries in their census evaluation programmes. As stated earlier, only 11 countries are known to have conducted post-enumeration sample enquiries to evaluate their censuses during the period 1975 to 1984. A brief review of the African experience regarding post-enumeration coverage evaluation survey has already been given in section 11 of this report.

14. Analysis of data

100. The prime purpose of a population and housing census is the production of statistical data to satisfy national needs for administration, planning and policy making. A census does not stop at the mere production of the data. The data should be evaluated, analysed, published and disseminated in a manner which can be used by the various users.

As a matter of fact, the latest definition of a census given by the UN is, "A census of population is the total process of collection, compiling, evaluating, analysing and publishing or otherwise disseminating demographic, economic and social data pertaining at a specified time to all persons in a country or in a well delimited part of a country" (UN, 1980). Contrasting this definition with the earliest one given also by the UN, "A census of population may be defined as the total process of collecting, compiling and publishing demographic, economic and social data pertaining at specified time or times to all persons in a country or delimited territory" (UN, 1964), it is clear that the focus of a census has perceptibly changed from mere collection, compilation and publication to the further steps of evaluation, analysis and dissemination of the results.

101. The quality of data, the types and varieties of analyses which can be carried out and the uses to which they can be put depend to a very large extent on the preparations and precautions which went into the data collection, its compilation and publication. Hence in the evaluation of the situation in respect of analysis of the data collected by the countries in the region during the period under consideration, we should keep in mind the pre-enumeration, the enumeration and post-enumeration activities.

102. Evaluation and analysis of the data collected and interpretation of the results in a manner which can be readily utilized by planners, policy makers and programme implementers is an important stage in the census. In order to achieve best results, it is advantageous to associate the analysts from the very early stages of planning a census. Consultations with users should be done by the data producer in conjunction with the analysts so that the three aspects --data production, data analysis and data utilisation-- are co-ordinated.

103. Since evaluation and analysis were not specifically spelt out in a few of the census programmes, financial and other constraints impeded the progress. It is advisable that not only the analysis, but the publication and dissemination of results should be envisaged at the preparatory stages of a census.

UN, Principles and recommendations for population and housing censuses, Series M No. 67, New York, 1980.

UN, Principles and recommendations for national population censuses, Series M No. 27, New York, 1964.

104. Since a large number of countries had their first census experience during this period, and trained manpower is in short supply, international expertise had to be utilized to assist countries in carrying out evaluation and analysis of the data. Even though it is useful to have some expertise from outside, it is necessary to stress that local personnel should benefit from this technical co-operation assistance. However, it has been observed that the experts being hard pressed for time did not devote as much time as required to train their counterparts so much so that when the experts left the vacuum more or less remained. Every effort should be made to involve local personnel fully in the analysis and interpretation of the data. This will not only ensure their training, it would also benefit the analysis because the knowledge of the local personnel on local conditions would be better and the analysis would be more meaningful. Local personnel should be fully associated in the exercise and get on-the-job training so that a cadre of personnel could be built up and dependence on long term external assistance reduced if not eliminated. Middle level and higher level on-the-job training of personnel for short periods of up to 3 weeks should be organized to expose local personnel to the techniques and methods. The experiences of Tanzania, Zimbabwe, Zambia and Mauritius are available for other countries to emulate. Utilization of training facilities in Accra and Yaounde should also go a long way in meeting some of the needs of the region. Associating middle level personnel in the analysis exercise as attempted by some countries is laudable and worth emulation by all in their 1990 round.

15. Dissemination of information

105. The usual practice of census offices in the past has been to publish the data and perhaps the evaluation, analysis and methodology reports. Some prepared an administration report. It has been noticed that the impact of the information on the eventual users is not as much as needed by the mere publication of results and it has been suggested that there should be a seminar or group of seminars not only to disseminate the findings and their implications but also to involve the users in the uses of the data and further production of data in future.

106. As mentioned earlier, the need for preparation of two types of analytical reports --a technical and a practical one-- to meet the diverse data users has been brought out by the experience of the 1980 round of censuses. Planners, policy makers and administrators will benefit more from the interpretation of results, their implications and suggestions for action.

107. A few months after publication of census results it would be desirable to organize a national or in case of large countries, regional seminars involving planners, policy makers and adminstrators. If data on socio-economic characteristics have been analysed and especially if projections have been prepared, the involvement of sectoral ministries in such seminars would be mutually beneficial. National seminars have been held in Ivory Coast, Burundi, Sudan, etc., and a series of regional seminars are being held in Tanzania. Such seminars should be held in all countries utilizing data from their latest census and surveys. International assistance --both financial and technical-- may be extended in organizing the seminars.

108. The needs for introspection and stock taking is as important in a census as in any operation involving huge investments of men and materials. Discussion of the lessons learnt and how to improve future efforts should be held so that not only the particular country but others could benefit from the experiences.

109. Population projections not only at the national level but also at sub-national and sectoral levels should be prepared and the implications and policies needed to take care of the unfolding situations. In addition to preparing the usual three variants --viz, the high, medium and low-- there is need for preparation of speculative projections with varying fertility, mortality, migration estimates to show the planners the implications of various demographic options.

110. Integration of population variables in planning is considered an essential purpose of data analysis and the demographer/analyst must associate himself with the planning agency in assisting in the full utilization of results. Dialogue between the demographer and planner is as essential as that between demographer and statistician in the first two stages --data collection and analysis. The three specialists -- statistician, demographer and planner-- should reinforce each other in order to reap the maximum benefit from a census operation. In this, the role of demographer as the vital link between the data producer and the data user cannot be over-emphasized.

16. Conclusions and recommendations

111. Considering the fact that for 19 out of the 47 countries which took a census during 1975-84 it was their first census experience and even for most of the others it was only the second census after national independence, the types and varieties of data collected was impressive. The review of the censuses conducted during the period has brought into focus some of the experiences and lessons which would prove useful for future censuses and other data collection programmes. The following are summary recommendations which may assist in taking full advantage of the past lessons.

(i) The various activities and aspects of a census should be given adequate consideration and time-tables and budgets prepared in advance and adhered to.

(ii) Data users should be involved in the discussion of the questionnaires, tabulation plans and plan of analysis to ensure full utility and relevance of data collected.

(iii) Plans for evaluation and analyses of the data should be formulated from the very first stages of preparations for a census.

(iv) It is advisable to have the analysts and data processing experts associated at the earliest stages of data collection so that the data collected could be used for the types of analyses needed.

(v) Data processing has been one of the most difficult problems faced by countries. Inordinate delays have been caused by bottlenecks in data processing. Efforts to reduce the time by utilising mini or micro computers with appropriate software by statistical offices should be explored.

(vi) It is recommended that census data should be evaluated and if a post enumeration survey is planned, then adequate preparations should be made in advance so that the exercise does not become unproductive.

(vii) Preparation of administrative reports documenting the various steps and stages of a census including expenditures and problems faced and how they were tackled would be useful not only for future reference for the country itself but also for other countries.

(viii) In addition to publishing the detailed tables, the preparation of analytical reports, monographs and general user oriented publications have been noted to be useful and should be planned from the early stages of data collection.

(ix) In addition to publication of tables, preparation of special data tapes and local area statistics may be useful for deeper analyses and regional planning.

(x) Many countries depended on long term resident international expertise to carry out evaluation and analysis of their census. While international co-operation and exchange of know-how is laudable, the close association of local personnel in such exercises should be ensured and insisted upon. In view of high cost, perhaps short duration intensive consultancy missions by international experts may be advantageous, if local personnel could be effectively associated with the exercise.

(xi) Because of lack of adequate trained manpower for analysis and interpretation of data, it is considered beneficial for not only higher level but also for middle and lower level personnel to be trained on-the-job in the manipulation of data. Short duration intensive in-service training programmes on data analysis is recommended.

(xii) Dissemination of the results of a census is an important agenda of a census undertaking and not only national seminars but perhaps regional or topic specific seminars like those on regional development, education, health or housing may be fruitful.

(xiii) An important use of census data is in planning and every effort must be made to integrate population and related variables in the planning process.

(xiv) Population projections at national, sub-national and sectoral levels should be prepared not only under the usual three variants but speculative illustrative projections should be made to demonstrate the implications of various policy options.